REMARKS

Claims 1 and 12 are amended. Claims 11, 20, and 24 are canceled. Claims 2-10, 13-19, and 21-23 stand as originally filed. Re-examination and reconsideration are requested.

In the office action, dated May 10, 2005, the examiner rejected claims 1-10, 12-19, and 21-23 under 35 U.S.C. §112, first paragraph, as failing to comply with the enablement requirement, as detailed in section 2 of the office action. The examiner also rejected claims 1-10, 12-19, and 21-23 under 35 U.S.C. §112, first and second paragraphs for the reasons specified in sections 3 and 4 of the office action.

Applicant respectfully traverses the examiner's rejections for the reasons that will be set forth below.

Re the Claims:

Claims 1 and 12 are amended to refer to detecting a plurality of emitted annihilation gamma rays.

Claims 11, 20, and 24 are canceled as being directed to a non-elected invention.

Argument:

Re the Section 112 rejections:

Claims 1 and 12 are amended to refer to detecting a plurality of gamma rays. Applicant believes that these amendments address the issues presented by the examiner in sections 2-4 of the office action. Indeed, in section 3 of the office action, the examiner stated that the specification is enabling for collecting positron annihilation data by detecting a plurality of emitted annihilation gamma rays. Consequently, it is believed that the pending claims, as amended are sufficiently definite under Section 112.

In section 2 of the office action, the examiner also rejected the claims as lacking enablement as to the Doppler broadening algorithm and the process for calculating positron lifetime data. These rejections are improper in that the Patent Office has failed to meet is burden of proof as to why the disclosure is insufficient.

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Legal Standard:

With regard to the burden of proof required to support a rejection under Section 112, the Patent Office is required to assume that the specification complies with the enablement provision of Section 112 unless it has acceptable evidence or reasoning to suggest otherwise. See, for example, *In re Marzocchi*, 439 F.2d 220, 169 USPQ 367 (CCPA 1979). The Patent Office thus must provide reasons, supported by the record as a whole, why the specification is not enabling. Then and only then does the burden shift to the applicant to show that one of ordinary skill in the art could have practiced the claimed invention without undue experimentation. *Gould v. Missinghoff*, 229 USPQ 1 (D.D.C. 1985), *aff'd in part, vacated in part, and remanded sub. nom., Gould v. Quigg*, 822 F.2d 1074, 3 USPQ2d 1302 (Fed. Cir. 1987). Mere conclusionary statements as to the level of ordinary skill in the art are not a sufficient basis for a rejection under 35 U.S.C. §112. *In re Brebner*, 455 F.2d 1402, 173 USPQ 169 (CCPA 1972). In addition, the law does not require, and indeed prefers, that a patent specification omit that which is well-known. *In re Buchner*, 929 F.2d 660, 18 USPQ2d 1331 (Fed. Cir. 1991).

Re the Doppler broadening algorithm:

The Doppler broadening algorithm is described in paragraphs [0047]-[0049] and spans pages 18-19. The specification describes the purpose of the Doppler broadening algorithm and what it involves (e.g., an assessment of the degree of broadening of the 511 keV peak associated with the annihilation gamma rays produced by the positron/electron annihilation event), see paragraph [0047]. Paragraph [0047] goes on to describe that a broadening of the peak is indicative of the presence of one or more lattice defects in the material specimen 12.

Paragraph [0048] and Figure 5 describe one method for determining the broadening of the 511 keV peak. Specifically, the method involved is based on a peak parameter, which may be defined as the number of counts in a central region 76 that contains about half of the total area of the 511 keV peak 74 divided by the total number of counts in the peak. Paragraph [0048] goes on to state that several types of Doppler broadening techniques are known in the art and could be utilized by persons having ordinary skill in the art after having become familiar with the teachings of the present invention. In addition, the description states that, in one embodiment,

the Doppler broadening algorithm may be that described in U.S. Patent No. 6,178,218 B1, the disclosure of which is incorporated by reference. That issued patent is evidence that such a description of the Doppler broadening technique is sufficiently enabling under Section 112.

Paragraph [0049], along with Figure 6 goes on to describe one embodiment of how the Doppler broadening algorithm 40 may involve the use of both detectors 30 and 32 in order to determine the degree of broadening of the 511 keV peak. Paragraph [0049] also gives a specific example of a collection time that will produce good results for the Doppler broadening algorithm.

The written description describes the Doppler broadening algorithm in sufficient detail to allow a person having ordinary skill in the art to practice the invention without undue experimentation. While the written description does not provide a "production specification" with a listing of the particular computer code (e.g., software) that may be utilized by the data processing system 24 to determine the degree of broadening of the 511 keV peak using the Doppler broadening algorithm, the ability to provide such computer code is well within the level of ordinary skill in the art and could be readily provided by persons having ordinary skill in the art after having become familiar with the teachings of the present invention.

In addition, applicant notes that these rejections as to lack of enablement of the Doppler broadening algorithm are basically identical to the rejections of examiner Palabrica that were reversed by the Board of Patent Appeals and Interferences on May 31, 2005, for a related patent application (serial no. 10/269,807). In that application, the Board found the written description and claims to be sufficiently enabling of the Doppler broadening algorithm in view of substantially the identical points raised here by examiner Palabrica.

Re the positron lifetime algorithm:

The positron lifetime algorithm is described in paragraphs [0043]-[0046] and spans pages 15-17. The specification describes the purpose of the positron lifetime algorithm, what it involves (e.g., the determination of an elapsed time between positron formation and positron annihilation). Paragraph [0044] describes how both detectors 30 and 32 may be used to determine the positron lifetime. Paragraph [0044] also describes example detection periods (e.g., between about 1

nanosecond to about 20 nanoseconds (12 nanoseconds preferred) during which annihilation data 22 is captured after the detection of a prompt gamma ray. Paragraph [0044] then goes on to describe that positron annihilation data 22 collected during the collection period corresponds to annihilation events resulting from the same events that caused the production of the prompt gamma ray.

Paragraph [0045] and Figure 4 describe one embodiment of apparatus that may be used to determine positron lifetime. More specifically, the data processing system 24 may be provided with first and second timing discriminators 42 and 44. Each timing discriminator is then connected to a fast coincidence processor 50 and a time-to-amplitude converter 52 in the manner illustrated in Figure 4. The combination of the timing discriminators 42 and 44, the fast coincidence processor 50, and the time-to-amplitude converter 52 allow the data processing system 24 to measure the time interval between the detection of the prompt gamma ray and the annihilation gamma ray.

Paragraph [0046] describes another embodiment of apparatus that may be used to determine positron lifetime. Paragraph [0046] also states that systems for detecting positron lifetimes, as well as the algorithms used thereby, are well-known in the art.

The written description describes the positron lifetime algorithm in sufficient detail to allow a person having ordinary skill in the art to practice the invention without undue experimentation. While the written description does not provide a production specification with step-by-step procedures for building and connecting the various hardware components, e.g., the timing discriminators, fast coincidence processors, the time-to-amplitude converter, etc., the ability to provide such devices is well within the level of skill of persons having ordinary skill in the art. Likewise, the particular computer code (e.g., software) that may be utilized by the data processing system 24 to determine the positron lifetime is also well within the level of ordinary skill in the art and could be readily provided by persons having ordinary skill in the art after having become familiar with the teachings of the present invention.

In addition, applicant notes that these rejections as to lack of enablement of the positron lifetime algorithm are basically identical to the rejections of examiner Palabrica that were reversed by the Board of Patent Appeals and Interferences on May 31, 2005, for a related patent
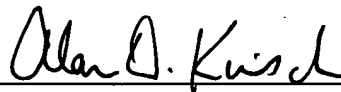
application (serial no. 10/269,807). That is, the Board found the written description and claims to be sufficiently enabling of the positron lifetime algorithm over substantially the identical points raised here by examiner Palabrica.

Summary:

As discussed above, the law presumes that the specification complies with the enablement provision of Section 112 unless the patent examiner provides acceptable evidence or reasoning to suggest otherwise. See, for example, *In re Marzocchi, supra.* Mere conclusionary statements will not suffice. *In re Brebner, supra.* In attempting to support his objections and rejections, the examiner looked only at certain limited portions of the disclosure (e.g., the drawings only) to the exclusion of those written portions of the specification that fully describe the various aspects of the invention. Therefore, the examiner has failed to provide evidence sufficient to establish the required *prima facie* case of insufficient disclosure. Accordingly, under *In re Marzocchi, supra,* the specification must be regarded as complying with the enablement provision of Section 112.

Applicant believes that all of the claims pending in this patent application are allowable and that all other issues raised by the examiner have been rectified. Therefore, applicant respectfully requests the examiner to reconsider his rejections and to grant an early allowance. If any questions or issues remain to be resolved, the examiner is requested to contact the applicant's attorney at the telephone number listed below.

Respectfully submitted,

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